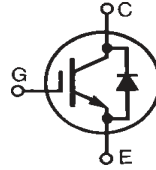


# High Voltage IGBT with Diode

## IXGR 32N170H1

Electrically Isolated Tab

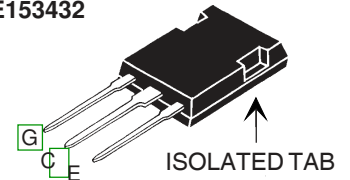
Preliminary Data Sheet



$$\begin{aligned} V_{CES} &= 1700 \text{ V} \\ I_{C25} &= 38 \text{ A} \\ V_{CE(sat)} &= 3.5 \text{ V} \\ t_{fi(typ)} &= 250 \text{ ns} \end{aligned}$$

Symbol	Test Conditions	Maximum Ratings	
$V_{CES}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$	1700	V
$V_{CGR}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GE} = 1 \text{ M}\Omega$	1700	V
$V_{GES}$	Continuous	$\pm 20$	V
$V_{GEM}$	Transient	$\pm 30$	V
$I_{C25}$	$T_C = 25^\circ\text{C}$	38	A
$I_{C90}$	$T_C = 90^\circ\text{C}$	20	A
$I_{F90}$		14	A
$I_{CM}$	$T_C = 25^\circ\text{C}$ , 1 ms	200	A
<b>SSOA (RBSOA)</b>	$V_{GE} = 15 \text{ V}$ , $T_{VJ} = 125^\circ\text{C}$ , $R_G = 5\Omega$ Clamped inductive load	$I_{CM} = 70$ @ $0.8 V_{CES}$	A
$t_{SC}$	$T_J = 125^\circ\text{C}$ , $V_{CE} = 1200 \text{ V}$ ; $V_{GE} = 15 \text{ V}$ , $R_G = 10\Omega$	10	$\mu\text{s}$
$P_C$	$T_C = 25^\circ\text{C}$	200	W
$T_J$		-55 ... +150	$^\circ\text{C}$
$T_{JM}$		150	$^\circ\text{C}$
$T_{stg}$		-55 ... +150	$^\circ\text{C}$
$F_C$	Mounting force with clamp	22...130/5...30	N/lb
$V_{ISOL}$	50/60 Hz, 1 minute	2500	~V
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	$^\circ\text{C}$
<b>Weight</b>		5	g

ISOPLUS247 (IXGR)  
E153432



G = Gate,  
E = Emitter  
C = Collector,

### Features

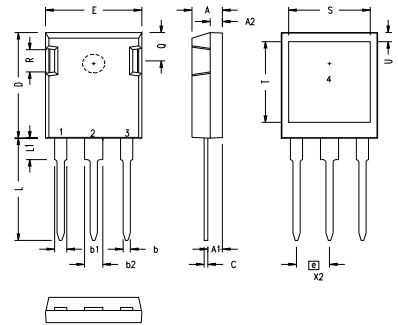
- Electrically Isolated tab
- High current handling capability
- MOS Gate turn-on  
- drive simplicity
- Rugged NPT structure
- Molding epoxies meet UL 94 V-0 flammability classification

### Applications

- Capacitor discharge & pulser circuits
- AC motor speed control
- DC servo and robot drives
- DC choppers
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ unless otherwise specified)		
		min.	typ.	max.
$BV_{CES}$	$I_C = 1 \text{ mA}$ , $V_{GE} = 0 \text{ V}$	1700		V
$V_{GE(th)}$	$I_C = 250 \mu\text{A}$ , $V_{CE} = V_{GE}$	3.0		V
$I_{CES}$	$V_{CE} = 0.8 \cdot V_{CES}$ $V_{GE} = 0 \text{ V}$ , Note 1 $T_J = 125^\circ\text{C}$			100 $\mu\text{A}$ 3 mA
$I_{GES}$	$V_{CE} = 0 \text{ V}$ , $V_{GE} = \pm 20 \text{ V}$			$\pm 100 \text{ nA}$
$V_{CE(sat)}$	$I_C = I_T$ , $V_{GE} = 15 \text{ V}$ Notes 2, 3 $T_J = 125^\circ\text{C}$	2.6 3.1	3.5	V V

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ unless otherwise specified)		
		min.	typ.	max.
$g_{fs}$	$I_C = I_T, V_{CE} = 10\text{ V}$ , Note 2	22	30	S
$C_{ies}$	$V_{CE} = 25\text{ V}$ , $V_{GE} = 0\text{ V}$ , $f = 1\text{ MHz}$		3670	pF
$C_{oes}$			210	pF
$C_{res}$			41	pF
$Q_g$	$I_C = I_T, V_{GE} = 15\text{ V}$ , $V_{CE} = 0.5 V_{CES}$		155	nC
$Q_{ge}$			28	nC
$Q_{gc}$			52	nC
$t_{d(on)}$	<b>Inductive load, <math>T_J = 25^\circ\text{C}</math></b>		45	ns
$t_{ri}$	$I_C = I_T, V_{GE} = 15\text{ V}$		38	ns
$t_{d(off)}$	$R_G = 2.7\ \Omega$ , $V_{CE} = 0.8 V_{CES}$ Note 4		270	500 ns
$t_{fi}$			250	500 ns
$E_{off}$			10.6	20 mJ
$t_{d(on)}$	<b>Inductive load, <math>T_J = 125^\circ\text{C}</math></b>		48	ns
$t_{ri}$	$I_C = I_T, V_{GE} = 15\text{ V}$		42	ns
$E_{on}$	$R_G = 2.7\ \Omega$ , $V_{CE} = 0.8 V_{CES}$ Note 4		6.0	mJ
$t_{d(off)}$			360	ns
$t_{fi}$			560	ns
$E_{off}$			13.6	mJ
$R_{thJC}$				0.65 K/W
$R_{thCK}$			0.15	K/W

**ISOPLUS247 Outline**


SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.190	.205	4.83	5.21
A1	.090	.100	2.29	2.54
A2	.075	.085	1.91	2.16
b	.045	.055	1.14	1.40
b1	.075	.084	1.91	2.13
b2	.115	.123	2.92	3.12
C	.024	.031	0.61	0.80
D	.819	.840	20.80	21.34
E	.620	.635	15.75	16.13
e	.215 BSC		5.45 BSC	
L	.780	.800	19.81	20.32
L1	.150	.170	3.81	4.32
Q	.220	.244	5.59	6.20
R	.170	.190	4.32	4.83
S	.520	.540	13.21	13.72
T	.620	.640	15.75	16.26
U	.065	.080	1.65	2.03

- 1 - GATE
- 2 - DRAIN (COLLECTOR)
- 3 - SOURCE (EMITTER)
- 4 - NO CONNECTION

NOTE: This drawing will meet all dimensions requirement of JEDEC outline TO-247AD except screw hole.

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ unless otherwise specified)		
		min.	typ.	max.
$V_F$	$I_F = 20\text{ A}$ , $V_{GE} = 0\text{ V}$ , Note 2 $T_J = 150^\circ\text{C}$			2.85 V 2.9 V
$V_{TO}$	For conduction power losses only $T_J = 150^\circ\text{C}$			2.1 V
$r_{FO}$	$T_J = 150^\circ\text{C}$			40 m $\Omega$
$I_{RM}$	$I_F = 20\text{ A}$ , $V_{GE} = 0\text{ V}$ , $V_R = 1200\text{ V}$ $-di_F/dt = 450\text{ A}/\mu\text{s}$ $T_J = 125^\circ\text{C}$		23 27	A A
$t_{rr}$	$T_J = 125^\circ\text{C}$		230 400	ns ns
$R_{thJC}$				1.5 K/W

- Notes: 1. Device must be heatsunk for high temperature leakage current measurements to avoid thermal runaway.  
 2. Pulse test,  $t \leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$   
 3. Test current  $I_T = 21\text{ A}$ .  
 4. Switching times may increase for  $V_{CE}$  (Clamp)  $> 0.8 \cdot V_{CES}$ , higher  $T_J$  or increased  $R_G$ .  
 5. See IXGH32N170 datasheets for additional IGBT characteristics.

IXYS reserves the right to change limits, test conditions, and dimensions.

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:	4,835,592	4,931,844	5,049,961	5,237,481	6,162,665	6,404,065 B1	6,683,344	6,727,585
	4,850,072	5,017,508	5,063,307	5,381,025	6,259,123 B1	6,534,343	6,710,405 B2	6,759,692
	4,881,106	5,034,796	5,187,117	5,486,715	6,306,728 B1	6,583,505	6,710,463	



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